

BORISLAV BOGDANOVIC ET AL.
USSN 09/809,575

CONDITIONAL PETITION FOR EXTENSION OF TIME

If entry and consideration of the amendments above requires an extension of time, Applicants respectfully request that this be considered a petition therefor. The Commissioner is authorized to charge any fee(s) due in this connection to Deposit Account No. 14-1263.

ADDITIONAL FEE

Please charge any insufficiency of fees, or credit any excess, to Deposit Account No. 14-1263.

REMARKS

Applicants respectfully request reconsideration and allowance of this application in view of the amendments above and the following comments.

Amendments have been made to claim 1. A clean copy of claim 1 is presented above. A mark-up showing the changes that have been made to claim 1 using brackets and underlining is attached.

The specification was objected to as failing to provide proper antecedent basis for the subject matter of claim 5. In response, Applicants have amended the specification at page 3 to provide clear antecedent basis. As the Examiner points out, claim 5 is an original claim and,

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therefore, the amendment of the specification to incorporate the subject matter thereof cannot constitute new matter as a matter of law.

Claims 1-4, 15 and 19-24 were rejected under 35 USC § 112, first paragraph, as being broader than the enabling disclosure. In response, Applicants point out that claim 1 has been reordered in a manner that, hopefully, will make clearer to the Examiner exactly what is claimed. The state of the art includes Applicants' own previous patent, U.S. Patent No. 6,117,372, which was prosecuted by the Examiner as well. Claim 1 of that patent (hereinafter "Applicants' prior patent"), which is, therefore, fully enabled, reads as follows:

"1. A process for the preparation of Grignard compounds comprising reacting an organic halide with magnesium metal in an ether solvent in the presence of an inorganic Grignard reagent catalyst prepared by a process comprising reacting a transition metal halide with magnesium metal, wherein said transition metal is a transition metal of groups 4 to 10 of the Periodic Table."

It should be clear that present claim 1 is only slightly broader than Applicants' prior patent—at least through clause (a)(ii) of present claim 1. Applicants submit that given Applicants' prior patent, and the acceptance of the enablement therein, there is no good reason to doubt the slightly broader present claim 1 at least through clause (a)(ii) thereof.

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The present invention represents an advance over Applicants' prior patent in the addition of "an activity-enhancing amount of an additional catalyst component" as specified in clause (b) of instant claim 1. The additional catalyst component is required by clauses (b)(i) and (b)(ii) to comprise hydrogen or an element of Periodic Table groups 14, 15, 16 or 17 bonded to a metal of Periodic Table groups 1, 2 or 13. Applicants submit that there is no good reason to doubt the enablement of this portion of claim 1 either.

The specification beginning at page 3 first provides a wealth of general details about the nature of this additional catalyst component and its mode of operation within the inventive process, then concludes with a large number of examples exemplifying the inventive process from a variety of different standpoints. Respectfully, pointing to a general unpredictability in the catalyst art does not satisfy the Examiner's burden of providing evidence or sound scientific reasoning why persons skilled in the art would doubt the allegations in the specification that the inventive process is enabled to the extent claimed. No evidence is cited, nor are sound scientific reasons given, that any way casts even a small doubt on the allegations in the specification that the inventive process is fully operable. Under these circumstances, Applicants submit that the enablement must be accepted. *In re Marzocchi et al.*, 169 USPQ 367, 369 (CCPA 1971).

In view of the foregoing, Applicants submit that the Examiner would be fully justified to reconsider and withdraw this rejection. An early notice that this rejection has been reconsidered and withdrawn is, therefore, earnestly solicited.

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Claims 1-24 were rejected under 35 USC § 112, second paragraph, as being indefinite. In response, Applicants have amended claim 1 to make clear that both a) a transition metal catalyst and b) an additional catalyst component are used. With respect to claims 15-18, Applicants point out that claim 15 refers to claim 1, then expressly provides that the cocatalysts are “additionally employed,” which suggests that they are up and beyond the transition metal catalyst and the additional catalyst component recited in claim 1. Finally, with respect to the Examiner’s objection to a lack of proper antecedent basis in claim 16, Applicants submit that no antecedent basis is necessary as neither the word “the” nor the word “said” precedes “ammonium halide” or “organoammonium halide.” Accordingly, these terms do not expressly or implicitly harken back to any preceding portion of any claim, and, therefore, there does not appear to be any need that these terms have antecedent basis.

In view of the foregoing, Applicants submit that the Examiner would be fully justified to reconsider and withdraw this rejection as well. An early notice that this rejection has been reconsidered and withdrawn is, therefore, also earnestly solicited.

For the record, Applicants emphasize that although claim 1 was amended to overcome this rejection, and, therefore, might be argued to have been amended for a reason substantially related to patentability, a fair reading of the amended claim will reveal that the departures from the previous claim were for clarification purposes only, and that Applicants did not narrow the claim in any material respect. Therefore, Applicants submit that the amended claim 1 remains

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entitled to the full range of equivalents.

Claims 1, 3-5, 8, 9 and 16 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2 and 6 of U.S. Patent No. 6,117,372. In response, Applicants point out that the differences from Applicants' prior patent have been explained above in great detail. As explained in the last paragraph on page 3 of the specification and continuing over to the top of page 8, the introduction of an activity-enhancing amount of the additional catalyst component is demonstrated in the examples in the specification to result in an unexpected, yet unmistakable, enhancement of the activity.

Thus, it is proven in the instant examples that additional catalyst component by itself does not cause catalysis of the Grignard reaction. However, when the transition metal catalyst and the additional catalyst component are combined, then enhanced catalytic effects are observed. This is clearly seen, for example, from the results reported in Examples 1 and 2.

In Examples 1 and 2, there is prepared a Grignard compound from 4-chlorobenzaldehyde diethyl acetyl, ethyl bromide, FeCl_2 and MgCl_2 . *In situ*, it is believed the ethyl bromide and the Mg combine to form EtMgBr as the additional catalyst component. It is expressly taught in the third paragraph on page 9 of the specification that the EtMgBr alone has no ability to catalyze the Grignard reaction. Thus, the comparative experiment involving the addition of ethyl bromide, but not either FeCl_2 or MgCl_2 , achieved a yield of desired product of < 6%.

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It is further taught in the last paragraph on page 9 of the specification, that the addition of small amounts of ethyl bromide, FeCl_2 and MgCl_2 yielded the desired product in only about 45% yield.

However, as taught in Example 1, the use of a larger amount of ethyl bromide unexpectedly boosted the yield to 81%. As taught in Example 2, the use of a still larger amount of ethyl bromide boosted the yield to 85%.

High yields were also demonstrated in Examples 4-8 using components other than ethyl bromide, which, therefore, involved additional catalyst components other than EtMgBr . A similar trend towards high yields is also reported in Example 9, and, in that case, there were additional comparative experiments additionally supporting the unexpected and surprising benefits that can be achieved if the additional catalyst component is included in the process, as presently claimed. Examples 10-14 and 17 show other variations. And, Examples 15 and 16 show still other variations, and, also provide additional comparison data supporting the unexpected improvement achieved when using the present invention.

Respectfully, there is absolutely nothing in Applicants' prior patent, or in the prior art to be discussed in further detail below, that teaches or suggests the benefits which clearly have been demonstrated on the present record. Accordingly, Applicants submit that these data must be regarded as surprising, and, therefore, unexpected, and, consequently, as objective evidence of

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nonobviousness. Although these data are not in declaration form, consistent with the rule that *all* evidence of nonobviousness must be considered when assessing patentability, the Examiner must consider the data in the specification in determining whether the claimed invention provides unexpected results. *In re Soni*, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995).

Since there is nothing in Applicants' prior patent that teaches or suggests the unexpected improvement demonstrated on the present record, the present claims are not obvious over the claims of Applicants' prior patent, and, consequently, there cannot be obviousness-type double patenting.

In view of the foregoing, Applicants submit that the Examiner would be fully justified to reconsider and withdraw this rejection as well. An early notice that this rejection has been reconsidered and withdrawn is, therefore, also earnestly solicited.

Claims 1-6, 8, 9 and 15-20 were rejected under 35 USC § 102(b) as being anticipated by Bogdanovic et al. ("Bogdanovic"), DE 196 28 159. In response, Applicants would remind the Examiner that anticipation requires that each and every element as set forth in the claim must be found, either expressly or inherently described, in a single prior art reference, and, further, the absence in the prior art reference of even a single one of the claim elements is sufficient to negate anticipation. *In re Robertson*, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). The cited Bogdanovic reference is the German equivalent of Applicants' prior U.S. patent. Accordingly,

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Bogdanovic also lacks any teaching of an activity-enhancing amount of an additional catalyst component as required by the present claims. Consequently, Bogdanovic cannot anticipate the present claims.

Further on this point, Applicants would call the attention of the Examiner to the third paragraph on page 6 of the instant specification. There is an acknowledgment that the Applicants previously used ethyl bromide and magnesium together, which, as noted above, if they were combined in sufficient amount, could give rise *in situ* to EtMgBr, which is an additional catalyst component within the present claims. However, as stated in the third paragraph on page 6 of the instant specification, Applicants previously used "a maximum of **4 drops** of ethyl bromide * * * for etching the Mg surface." Such amount is inadequate to provide an increase in the transition metal catalyst activity as required by the present claims. Consequently, Bogdanovic cannot be considered even a technical anticipation of the present claims.

In view of the foregoing, Applicants submit that the Examiner would be fully justified to reconsider and withdraw this rejection as well. An early notice that this rejection has been reconsidered and withdrawn is, therefore, also earnestly solicited.

Claims 1, 9-13 and 20-24 were rejected under 35 USC § 103(a) as being obvious over Bogdanovic in view of *Chem. Abst.* 76: 121246, *Chem. Abst.* 77: 164798 and *Chem. Abst.* 114: 42844. In response, Applicants point out that the deficiencies of Bogdanovic are discussed

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above. The Examiner relied on the various Chemical Abstracts to show the activation of magnesium. However, as should now be clear, the present claims require more than this—they require the addition of an additional catalyst component and in the amount recited. The Chemical Abstracts do not teach or suggest this feature of the present claims. Consequently, the combination of Bogdanovic and the Chemical Abstracts could not have made the present invention *prima facie* obvious to persons skilled in the art.

In view of the foregoing, Applicants submit that the Examiner would be fully justified to reconsider and withdraw this rejection as well. An early notice that this rejection has been reconsidered and withdrawn is, therefore, also earnestly solicited.

Claims 1, 2, 5, 6, 15 and 19 were rejected under 35 USC § 103(a) as being obvious over Ramsden, U.S. Patent No. 2,777,885. In response, Applicants point out that Applicants' prior patent stands a proof of the patentability of the use of a transition metal catalyst alone. The present invention extends the protection to the use of the combination of a transition metal catalyst and the additional catalyst component. The data in the instant specification, as indicated above, prove the unexpected results achieved when the transition metal catalyst and the additional catalyst component are used in combination. Accordingly, Ramsden could not have made the present invention *prima facie* obvious.

In view of the foregoing, Applicants submit that the Examiner would be fully justified to

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reconsider and withdraw this rejection as well. An early notice that this rejection has been reconsidered and withdrawn is, therefore, also earnestly solicited.

Claims 1 and 20-24 were rejected under 35 USC § 103(a) as being obvious over Ramsden in view of *Chem. Abst.* 76: 121246, *Chem. Abst.* 77: 164798 and *Chem. Abst.* 114: 42844. In response, Applicants point out that the deficiencies of Ramsden are discussed above. The Examiner has again relied on the various Chemical Abstracts to show the activation of magnesium. However, as indicated above, the present claims require more than this—they require the addition of an additional catalyst component and in the amount recited. The Chemical Abstracts do not teach or suggest this feature of the present claims. Consequently, the combination of Ramsden and the Chemical Abstracts could not have made the present invention *prima facie* obvious to persons skilled in the art.

In view of the foregoing, Applicants submit that the Examiner would be fully justified to reconsider and withdraw this rejection as well. An early notice that this rejection has been reconsidered and withdrawn is, therefore, also earnestly solicited.

Applicants believe that the foregoing constitutes a bona fide response to all outstanding objections and rejections.

Applicants also believe that this application is in condition for immediate allowance.

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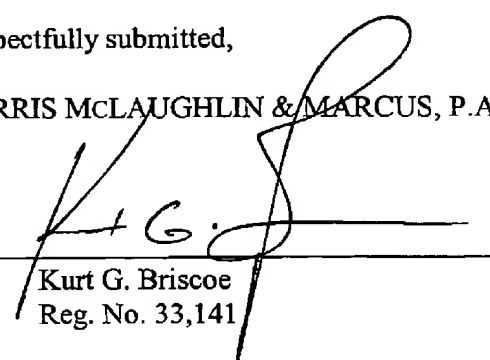
However, should any issue(s) of a minor nature remain, the Examiner is respectfully requested to telephone the undersigned at telephone number (212) 808-0700 so that the issue(s) might be promptly resolved.

Early and favorable action is earnestly solicited.

Respectfully submitted,

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that the foregoing Amendment under 37 CFR § 1.111 and the attached Mark-Up Showing the Changes Made in the Previous Claim to Yield the Claim as Amended Above (14 pages total) are being facsimile transmitted to the United States Patent and Trademark Office on the date indicated below:

Date: February 14, 2002

By


Kurt G. Briscoe

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**MARK-UP SHOWING THE CHANGES MADE IN THE PREVIOUS CLAIM TO YIELD
THE CLAIM AS AMENDED ABOVE**

--1. (Once Amended) A process for the preparation of a Grignard compound, said process comprising reacting an organic halide and magnesium metal in a solvent in the presence of:

- a)** a transition metal catalyst [and an additional catalyst component, said transition metal catalyst] comprising:

 - i)** a transition metal selected from Periodic Table groups 3, 4, 5, 6, 7, 8, 9, 10 or 11;[,] and
 - ii)** one or more elements selected from groups 14, 15, 16 or 17 bonded to said transition metal;[,] and [said]
- b)** an activity-enhancing amount of an additional catalyst component,
said additional catalyst component comprising:

 - i)** a compound of a metal of Periodic Table groups 1, 2 or 13;[,] and
 - ii)** one or more elements of Periodic Table groups 14, 15, 16 or 17 or hydrogen bonded to said metal of Periodic Table groups 1, 2 or 13. --